

XIV. *Micropteryx* entitled to ordinal rank; Order ZEUGLOPTERA. By T. A. CHAPMAN, M.D.

[Read October 4th, 1916.]

PLATES LXXXI-XCII.

THE object of this short paper is to call attention to a fact in the anatomy of the species of the genus *Micropteryx*,\* that appears so far to have escaped observation—at any rate, I am not aware of any record of it—and which is yet one of primary importance, with reference to the position of the genus in any classification.

It might give this paper a more imposing length if I fully quoted Walter's † account of the mouth parts of *Micropteryx*, and my own paper on the larva, ‡ and especially to transfer in full Packard's discussion § of these papers, in which he founded for *Micropteryx* a sub-order PROTO-LEPIDOPTERA, or LEPIDOPTERA LACINIATA, a discussion occupying three and a half pages of his Monograph on the Bombycine Moths. Packard notes a further character, viz. "the male genital armature neuropteroid, exserted, dorsal, lateral, and sternal appendages very large."

These papers are, however, fairly accessible, and under present conditions it seems a duty to make a paper as short, instead of as long, as possible.

Packard would have been justified, on the facts before him, in placing *Micropteryx* in a new order, instead of a sub-order. However this may be, the further structural

\* *Micropteryx*, Hubner, seems to be the name to which this genus is entitled. In my paper on the larva I adopted the name *Eriocephala*, and Packard did so also. This is a name given by Curtis, and sinks as a synonym; but it had (and has) the advantage of referring to this genus only, whereas *Micropteryx* for long included *Eriocrania* also, and has even been applied, but of course wrongly, to *Eriocrania*, to the exclusion of *Micropteryx* proper (*calthella*, F.).

† Dr. Alfred Walter, "Jenaische Zeitschrift für Naturwissenschaft," vol. 18, p. 755, 1885. (24)

‡ T. A. C., Trans. Ent. Soc., 1894, p. 335.

§ Dr. A. Packard, Mem. Natural Academy of Sciences, Washington, vol. vii, p. 58, 1895.

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character I call attention to might, perhaps, alone, justify its ordinal separation, but, taken with the other characters, seems to remove it entirely from the Lepidoptera. Indeed, it remains difficult to suggest that *Micropteryx* has any lepidopterous character except the possession of scales. The neururation is also, perhaps, *primâ facie*, lepidopterous; but both this particular neururation and the possession of scales are to be found in insects having no claim to be lepidopterous. I have been aware of this particular structural character for many years, but only recently has it occurred to me to co-ordinate it with the other structures in the genus.

The Order Lepidoptera is specially distinguished by the female genitalia possessing two openings—a terminal one for oviposition, and one in the 8th segment for pairing; and in connection with this only nine segments can be counted in the abdomen of the female imago, instead of ten as in the larva pupa and male imago.

I hope in another communication to discuss how the missing segment is to be accounted for; this is, however, immaterial for the present purpose, which is to compare the apparently nine segments with two genital openings of all female Lepidoptera, with the ten segments and no genital opening except in the 10th segment in *Micropteryx*. This fact by itself seems to be sufficient to prevent *Micropteryx* being classified as belonging to the Lepidoptera, even in a sub-order.

There is a point that I ought, perhaps, to deal with. Cholodkowsky \* says that *Nematois metallicus* (*scabiosellus*) differs from other Lepidoptera in that the female has only one sexual opening, and Prof. W. Hatchett Jackson † appears to accept this conclusion. Collating Cholodkowsky's description of the anatomy of the *Nematois metallicus* with my own observation of the structures in the Aculeate Lepidoptera, the first thing that occurs to me is that Cholodkowsky did not appear to understand that the inner rods with their dagger point belonged to a different segment to that of the outer rods, and in oviposition travelled beyond them, and as well as piercing formed also the ovipositor. The ovipositing opening is near the end of the inner rods (terminal segment). He describes the

\* "Zeitschrift f. Wissensch.," Zoologie, vol. xlii, p. 562 (1885).

† "Morphology of the Lepidoptera," Trans. Linn. Soc., Zool. 2d, vol. v, p. 149.

rods as one piece, cutting the opening, and the egg being placed therein from another opening. Further, the rods (bristles) are dorsal to the viscera, certainly to all sexual openings; but Cholodkowsky describes them as ventral to the vagina he describes. This may have been a clerical error: if so, then it is possible that the opening he mentions may have been that of the 8th segment, since it is certain that he overlooked that in the 10th segment (the inner rods (bristles)), viz. the real ovipositor.

I may refer to Dr. Wood's paper in the "Ent. Mo. Mag." (vol. xxvii, 1891).

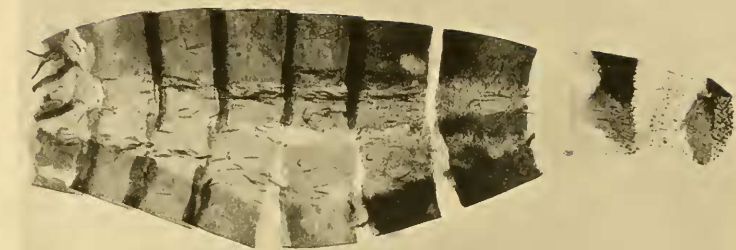
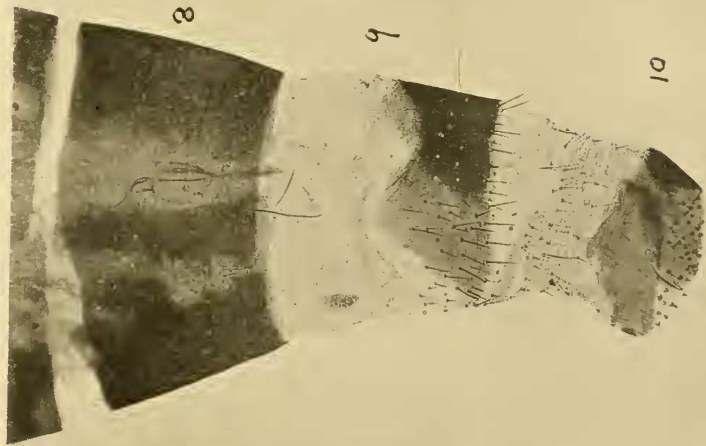
Whether or no the Lepidoptera originated from some form similar to *Micropteryx*, it probably arose from one with only a terminal female opening, and it seems not unlikely that the second forward opening in the 8th segment arose (in *Eriocrania*, the forerunner of the Aculeate Lepidoptera) from the difficult position of the (otherwise) single opening on the ventral surface of a sharp knife. It is, perhaps, going a little beyond the real subject of this paper, but the structure of the female pupa of Lepidoptera shows an opening that is, perhaps, in view of the imaginal structure, most easily described as in the 8th (abl.) segment, but may also be taken to be really in the 10th. The appearance is as though the opening belonged to the 10th, but had somehow been pushed forward, the 10th segment being continued forward to the posterior angle of the opening, and the 9th impinging on the sides of its posterior half.

I am not qualified to weigh the possibility of the single (10th segment) opening dividing into two, and the anterior one thus passing forward, leaving its track in the well-known configuration I have referred to, but the pupal appearances strongly suggest it.

Zeugloptera\* seems to be a reasonable name for the New Order which this compels us to recognise, and is suggested by Mr. Durrant.

The appended photographs of the abdominal segmentation of the abdomen in the females of *Micropteryx* show that there is no opening in any segment of the abdomen except at the extremity, and that the 8th segment is a well-developed one. Though I have examined scores of specimens and mounted a good many, I find few of my

\* Ζεύγλη = *jugum*, Πτερον = *ala*.



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*Photo, F. N. Clark.*

**MICROPTERYX THUNBERGELLA, ABDOMEN OF FEMALE.**

